

## AISI 4145 Steel

**Categories:** [Metal](#); [Ferrous Metal](#); [Alloy Steel](#); [AISI 4000 Series Steel](#); [Low Alloy Steel](#); [Carbon Steel](#); [Medium Carbon Steel](#)

**Material Notes:** Oil quenched. Forging temp.: 1205°C (2200°F) max. Annealing temp.: 790 - 845°C. Hardening temp.: 815 - 845°C. Tempered to desired hardness.

**Key Words:** alloy steels, UNS G41450, ASTM A322, ASTM A331, ASTM A505, ASTM A519, MIL SPEC MIL-S-16974, SAE J404, SAE J412, SAE J770

**Vendors:** No vendors are listed for this material. Please [click here](#) if you are a supplier and would like information on how to add your listing to this material.

Physical Properties	Metric	English	Comments
Density	7.85 g/cc	0.284 lb/in³	
Mechanical Properties	Metric	English	Comments
Hardness, Brinell	208	208	Annealed and cold drawn
Hardness, Knoop	230	230	Converted from Brinell
Hardness, Rockwell B	94	94	Converted from Brinell
Hardness, Rockwell C	15	15	Converted from Brinell hardness. Value below normal HRC range, for comparison purposes only.
Hardness, Vickers	218	218	Converted from Brinell
Modulus of Elasticity	205 GPa	29700 ksi	Typical for steel
Bulk Modulus	160 GPa	23200 ksi	Typical for steels.
Poissons Ratio	0.29	0.29	Calculated
Machinability	60 %	60 %	annealed and cold drawn. Based on 100% machinability for AISI 1212 steel.
Shear Modulus	80.0 GPa	11600 ksi	Typical for steels.
Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000263 ohm-cm	0.0000263 ohm-cm	
Thermal Properties	Metric	English	Comments
Specific Heat Capacity	0.473 J/g-°C	0.113 BTU/lb-°F	
Thermal Conductivity	42.6 W/m-K	296 BTU-in/hr-ft²-°F	
Component Elements Properties	Metric	English	Comments
Carbon, C	0.43 - 0.48 %	0.43 - 0.48 %	
Chromium, Cr	0.80 - 1.1 %	0.80 - 1.1 %	
Iron, Fe	96.795 - 97.72 %	96.795 - 97.72 %	As remainder
Manganese, Mn	0.75 - 1.0 %	0.75 - 1.0 %	
Molybdenum, Mo	0.15 - 0.25 %	0.15 - 0.25 %	
Phosphorous, P	<= 0.035 %	<= 0.035 %	
Silicon, Si	0.15 - 0.30 %	0.15 - 0.30 %	
Sulfur, S	<= 0.040 %	<= 0.040 %	

[References](#) for this datasheet.

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's [terms of use](#) regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.